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METAL INPUTS OF THREE MACHINES MADE BY THE SOVIET ROSTSEL'MASH PLANT

Engr N. G. Pchel'nikov

Ordinary carbon steel rolled stock is one of the largest items, both in
terms of cost and in terms of weight, going into machines made by the Rostsel'-
mash Plant.

A breakdown of the materials going into the Stalinets-6 combine, the KS-10
self-propelled mower, and the modernized P-5-35 M plow is given in the table
below.

Net Weight per Machine (kg)

Material	Stalinets-6 Combine	KS-10 Self- Propelled Mower	P-5-35 M Plow
Gray iron	801.6	305.9	67.4
Malleable iron	203.6	438.1	0.72
Steel castings	72.8	--	275.0
Nonferrous castings	--	0.597	--
Sheet steel	1,524.4	212.2	92.3
Steel circles	716.8	434.4	167.8
Strip steel	393.5	211.3	195.5
Steel shapes	1,700.6	386.5	404.4

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<u>Material</u>	<u>Net Weight per Machine (kg)</u>		
	<u>Stalinet-6 Combine</u>	<u>KS-10 Self- Propelled Mower</u>	<u>P-5-35 M Plow</u>
Steel tube	111.3	11.6	3.6
Nonferrous rolled stock	0.458	0.059	--
Softwood	346.261	--	--
Hardwood	114.0	9.88	--
Miscellaneous	196.9	598.8	0.47
Motor	450.0	--	--
Fasteners	135.0	52.4	52.7
Total	6,767.2	2,662	1,260
Total ferrous rolled stock	4,446.6	1,256.0	863.6
Ferrous rolled stock in percent of total weight	65.8	47.2	68.9

Thus, about two thirds, by weight, of agricultural machines such as combines, plows, and other machines consists of ferrous rolled stock, and most of this is hot rolled stock.

Up to 1951, the Rostsel'mash Plant had not sufficiently organized the layout of the great variety of shape and sheet rolled stock it used. All shops which processed metal had their own stock layout sections. These sections did not receive much attention from the plant management; there was no concerted effort to utilize leftover ends of metal, and there was no accounting of the flow and consumption of metal at various stages of processing. The ferrous metals stock room adjoined the primary-processing sections of the shops, and was under the plant Supply Division, which was headed by the deputy director for general affairs and supply. This created a number of organizational difficulties, confusion in accounting, and overconsumption of metal. It became clearer every day that one single authority was needed to control all movement of metal from its entry into the plant to the completion of parts for subassembly.

The plant decided to organize shops for laying out metal, and likewise shops for laying out wood, which the plant also consumes in great quantities. In early 1951, the Collegium of the Ministry of Agricultural Machine Building authorized the Rostsel'mash Plant to organize three metal stock layout shops and one wood layout shop.

The stock layout shops have been placed in existing shops as follows: stock layout shop No 1 occupies 25 percent of the area of the forge shop, stock layout shop No 2 occupies 25 percent of the area of the pressing shop, stock layout shop No 3 occupies 25 percent of the area of the cold stamping department of the combine shop, and stock layout shop No 4 is located in various parts of the former wood cutting shop.

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The shops have the usual administrative setup: a shop chief, deputy shop chief, technologist, norm setter, accountant, senior foreman, and foreman.

All four stock layout shops are directed by the deputy director for supply, who also controls all stock rooms at the plant.

The volume of work carried out by the shops is shown in the following table.

<u>Stock Layout Shop</u>	<u>No of Different Parts Processed by the Shop</u>	<u>No of Operations Carried Out in the Shop</u>
No 1	481	717
No 2	536	719
No 3	534	583
No 4	122, plus 46 types of packing cases	882

In organizing the stock layout shops, much preparatory work had to be done in changing the routing of parts. Especially difficult was the task of breaking down layout into individual operations.

In the stock layout shops, the metal undergoes the following typical operations: cutting of shape rolled stock on profile shears, cutting of sheet metal on guillotine shears, cutting of strip metal and punching holes in it on presses (in making the simplest types of blanks), cutting of shape rolled stock and tube with circular saws, and straightening of blanks.

In the wood layout shop, the basic operations are drying of lumber in drying kilns, lengthwise cutting on circular saws, and crosswise facing (cutting) on swing saws.

The organization of four independent shops led to an increase in expenditures on administrative personnel, but no other major expenditures were necessary.

The table below compares the consumption of metal before and after the organization of the stock layout shops. The main point brought out by the table is that actual metal consumption for both machines was reduced; 255.8 kilograms for the Stalinets-6 combine and 109.3 kilograms for the KS-10 self-propelled mower.

<u>Index</u>	<u>Stalinets-6 Combine</u>			<u>KS-10 Mower</u>		
	<u>1950</u>	<u>1951</u>	<u>Difference</u>	<u>1950</u>	<u>1951</u>	<u>Difference</u>
Norm for consumption of rolled metal stock per machine (kg)	4,850.0	4,690.5	159.5	1,602.9	1,591.4	11.5
Actual consumption of rolled metal stock per machine (kg)	5,039.7	4,783.9	255.8	1,682.1	1,572.8	109.3

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The reduction in metal consumption for the actual 1951 output of the two machines above amounted to 4,045 tons of rolled stock. Most of this reduction was achieved in stock layout shops No 2 and No 3.

Another indication of the efficacy of the stock layout shops is the sharp reduction of rejects in the press forging and metal products shops, which are serviced by stock layout shops No 1 and No 2; and in the combine shop, which is serviced by stock layout shop No 3. The table below shows the 1951 reduction in rejects in the press forging shop, by quarters.

<u>Quarter of 1951</u>	<u>Rejects</u>	
	<u>In Tons</u>	<u>In Percent of Stock</u>
First	131	0.69
Second	85	0.57
Third	48	0.34
Fourth	32	0.21

It may be seen that rejects were greatest in the first quarter, when the stock layout shops had not yet been organized, and gradually decreased in the last three quarters after the stock layout shops had been organized.

The organization of a wood layout shop brought about a sharp reduction in rejects in the adjoining woodworking shop. In the first quarter 1951, before the wood layout shop was set up, losses due to rejects in the woodworking shop were 1.51 percent, but in the second and third quarters 1951, after the layout shop was set up, losses due to rejects were only 0.26 percent.

The following advantages were obtained from the metal and wood stock layout shops:

1. There has been a reduction in the quantity (tonnage) of unusable ends of materials (that is, the coefficient of utilization of metals and wood was raised).
2. Usable ends of materials not used at the plant are shipped to other enterprises in the city, and the amount of material consigned to scrap has been sharply reduced.
3. The actual metal consumption per machine for all machines has been reduced, as compared to 1950.
4. The quality of blanks has been improved, which helps reduce rejects in the machining shops.
5. There has been a reduction in the number of machine tool setups, there is better planning, and hence greater productivity.

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